

ABSTRACT

The present invention provides a magnetic thin film, which can be produced by the same dry process as that in case of a magnetoresistive element constituting a read head and has excellent soft magnetic characteristics with a saturation magnetic flux density of 2T or more and a coercive force of 2 Oe or less, which are suited for use as a magnetic pole material of a recording head, a method of producing the same, and a magnetic head, a magnetic recording device, and a magnetic device using the same.

The magnetic thin film of the present invention has the feature that it consists of an iron carbide film, said iron carbide film comprising a martensite (α') phase as the principal phase and at least carbon and iron as constituent elements. The iron carbide film preferably consists of a single α' phase. The iron carbide film is a magnetic thin film specified by the fact that a diffraction peak from the (002) plane of the α' phase is observed as a principal peak by means of an X-ray diffraction method or an electron diffraction method in said iron carbide film. The iron carbide film has a body-centered tetragonal structure and an c-axis constitutes an axis of hard magnetization and, furthermore, a c-plane constitutes a plane of easy magnetization. The axis of hard magnetization constitutes a direction which is generally perpendicular to the film surface, and the plane

of easy magnetization constitutes a direction which is generally parallel to the film surface.

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